

Work Order ID 135132

135132

Page 1

July 31, 2015 9:16:34 AM

Item ID: D412-596-203TRN

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Crosstube Aft Extended Turning Detail

Start Date: 7/29/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 8/12/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: SH Date: 20150731

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D412-596-203	B PA1 U/R UP 15/12/31

100 0.00

100

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Cut tube on chop saw, leave extra mat'l for facing.
2-Face tube to length.

1 ϕ mm
15/12/01

110

QC1- Inspection performed by CMM

0.00

110

QC

Memo

0.00

Quality Control

1 ϕ mm
15/12/03

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>				Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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OTHER : ☐																					

Work Order ID 135132

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Page 2

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Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Aft Extended Turning Detail

Start Date: 7/29/2015 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 8/12/2015 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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120

0.00

120

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs on both ends
2-Turn as per Folio FB177
3- File transition lines smooth.
4-Scribe part # as per Dwg D412-596-203
FOLIO REV: AB
DWG REV: AB

1 0

mark
15/12/07

130

0.00

130

QC1- Inspection performed by CMM

QC

Memo

0.00

Quality Control

1 0

mark
15/12/08

140

0.00

140

QC8- Inspect parts - second check

QC

Memo

0.00

Quality Control

1 0

DAS
47
9-89

15-12-18

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

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NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150		0.00							
150	Large Fab								
Crosstubes	Memo	0.00							
Crosstubes	Grind machining marks smooth longitude way.								
180		0.00							
180	QC15- Crosstube Dimensional Check								
QC	Memo	0.00							
Quality Control									
190		0.00							
190	Identify as per dwg & Stock Location: <u>L603</u>								
Packaging	Packaging								
Packaging	Memo	0.00							
	Identify and stock in kanban rack Location: _____								

15-12-22

DEC 22 2015

DAS
9
9-8915-12-22

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

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Work Order ID 135132***135132***

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July 31, 2015 9:16:34 AM

Item ID: D412-596-203TRN

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Aft Extended Turning Detail

Start Date: 7/29/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 8/12/2015 Req'd Qty: 1.00

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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200 QC21- Final Inspection - Work Order Release

0.00

200

QC

Memo

0.00

Quality Control

MCS DEC 23 2015

SH 20151222

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
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OTHER : ☐					

Picklist Print

July 31, 2015 9:16:39 AM

Page 1

Work Order ID: 135132

135132

Parent Item: D412-596-203TRN

D412-596-203TRN

Parent Item Name: Crosstube Aft Extended Turning Detail

Start Date: 7/29/2015

Required Date: 8/12/2015

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV: A NEW ISSUE JFS 13/03/22 VERIFY BY: DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6020-160		Manufactured	No			100	Each	17.0000	1	1			
D6020-160									**				
Crosstube Material													

Location

Loc Qty

Loc Code

HALL

5

126259

5

SHED

12

126259

12

mm L 15/12/01

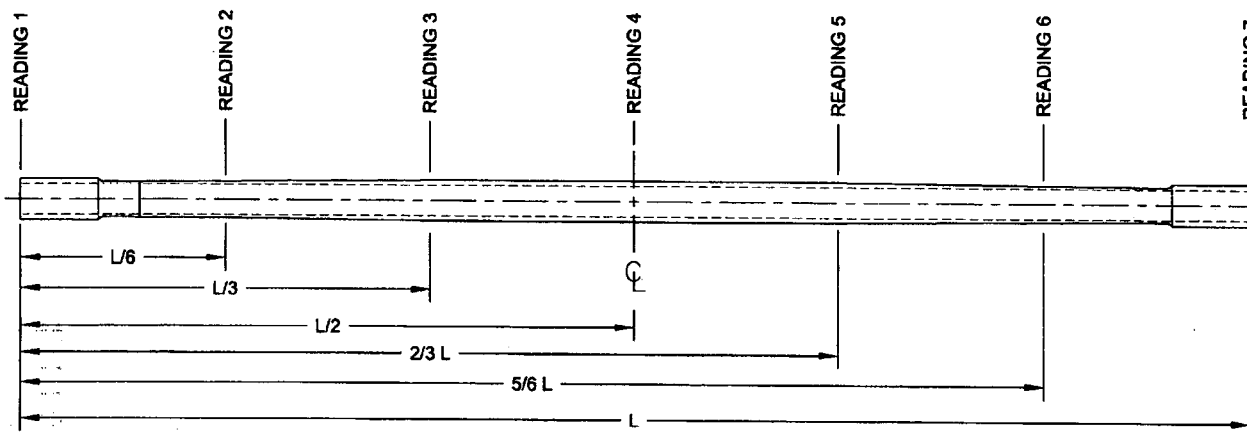
DART AEROSPACE LTD	Work Order:	135132
Description: Crosstube Assembly (412 Hi Hi Aft)	Part Number:	D412-596-203
Inspection Dwg: D412-596-203 Rev: B		Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet	Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	R0.50	+/-0.010	.500	/		RG	
	8.44	+/-0.060	8.441	/		vern	CNC-08
	Ø3.250	+0.000/-0.010	3.249	/		↓	
	Ø2.875	+0.005/-0.000	2.875	/			
	Ø2.875	+0.005/-0.000	2.878	/			
	Ø2.935	+0.005/-0.000	2.938	/			
	Ø2.999	+0.005/-0.000	2.999	/			
	Ø3.063	+0.005/-0.000	3.066	/			
	Ø3.125	+0.005/-0.000	3.130	/			
	Ø3.250	+0.005/-0.000	3.255	/			
SIDE B	R0.50	+/-0.010	.500	/		RG	
	8.44	+/-0.060	8.44	/		vern	CNC-08
	Ø3.250	+0.000/-0.010	3.249	/		↓	
	Ø2.875	+0.005/-0.000	2.876	/			
	Ø2.875	+0.005/-0.000	2.878	/			
	Ø2.935	+0.005/-0.000	2.938	/			
	Ø2.999	+0.005/-0.000	3.000	/			
	Ø3.063	+0.005/-0.000	3.066	/			
	Ø3.125	+0.005/-0.000	3.128	/			
	Ø3.250	+0.005/-0.000	3.255	/			
	151.38	+/-0.060	151.38	/		tape	LG-11

DART AEROSPACE LTD	Work Order: 135132
Description: Crosstube Assembly (412 Hi Hi Aft)	Part Number: D412-596-203
Inspection Dwg: D412-596-203 Rev: B	Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L=0"	.441	.443	.441	.441	.002	0.073
READING 2 L=25	.258	.261	.271	.268	.013	
READING 3 L=51	.343	.343	.357	.350	.014	
READING 4 L=76	.445	.446	.443	.444	.003	
READING 5 L=101	.339	.345	.352	.344	.013	
READING 6 L=127	.257	.265	.268	.259	.011	
READING 7 L=151	.441	.438	.442	.441	.004	

Calibration Result

Actual Block Thickness: .100 .500

DAS 47 Sitiescan 250 Measured Thickness: .100 .500

Measured by: gmm/L
Date: 15/12/08

Audited by: 47
Date: 15-12-18

Preliminary Approval:
Date:

Rev	Date	Change	Revised by	Approved
A	15.04.27	New Issue	KJ	

Item	Qty -203	Part Number	Description
1	X	D412-596-203	CROSSTUBE ASSEMBLY (412 HI HI AFT)
2	1	D6020-170	CROSSTUBE MATERIAL
3	2	D3595-063-530	RUBBER CUSHION
4	1	D4909-1	SUPPORT
5	2	D4910-1	CHAFING SHIELD
7	4	MS21920-26	CLAMP
8	2	MS21920-28	CLAMP
9	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
10	A/R	PROSEAL 890	SEALANT

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6020-170
FINISHED LENGTH = 161.38±0.060 (BEFORE BENDING/TRIMMING)
- 2) FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN B6-2, HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, REMOVE MASKING AND APPLY MATTE CLEAR COAT PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART P/N "D412-596-203" AND B/N ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 191.1 lb RAW MATERIAL, 118.3 lb AFTER MACHINING
116.0 lb FINISHED WEIGHT
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

BENDING

- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7% (BASED ON O.D.) IN LOWER HALF OF R35 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. TO BE PERFORMED AFTER FINAL POST-BEND GRINDING. ANY ADDITIONAL GRINDING REQUIRES ANOTHER LPI INSPECTION.

ASSEMBLY

- 12) INSTALL D4909-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015.
- 13) INSTALL MS21920-28 CLAMPS WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D4909-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) IF NOT ALREADY PRESENT ON CHAFING SHIELD, APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D4910-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D4910-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- 15) TORQUE CLAMPS ON D4909-1 SUPPORT 80 TO 100 IN-LB. TORQUE CLAMPS ON D4910-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

UNDER REVIEW OK
11/17/13
URF 14-601 9/14/14

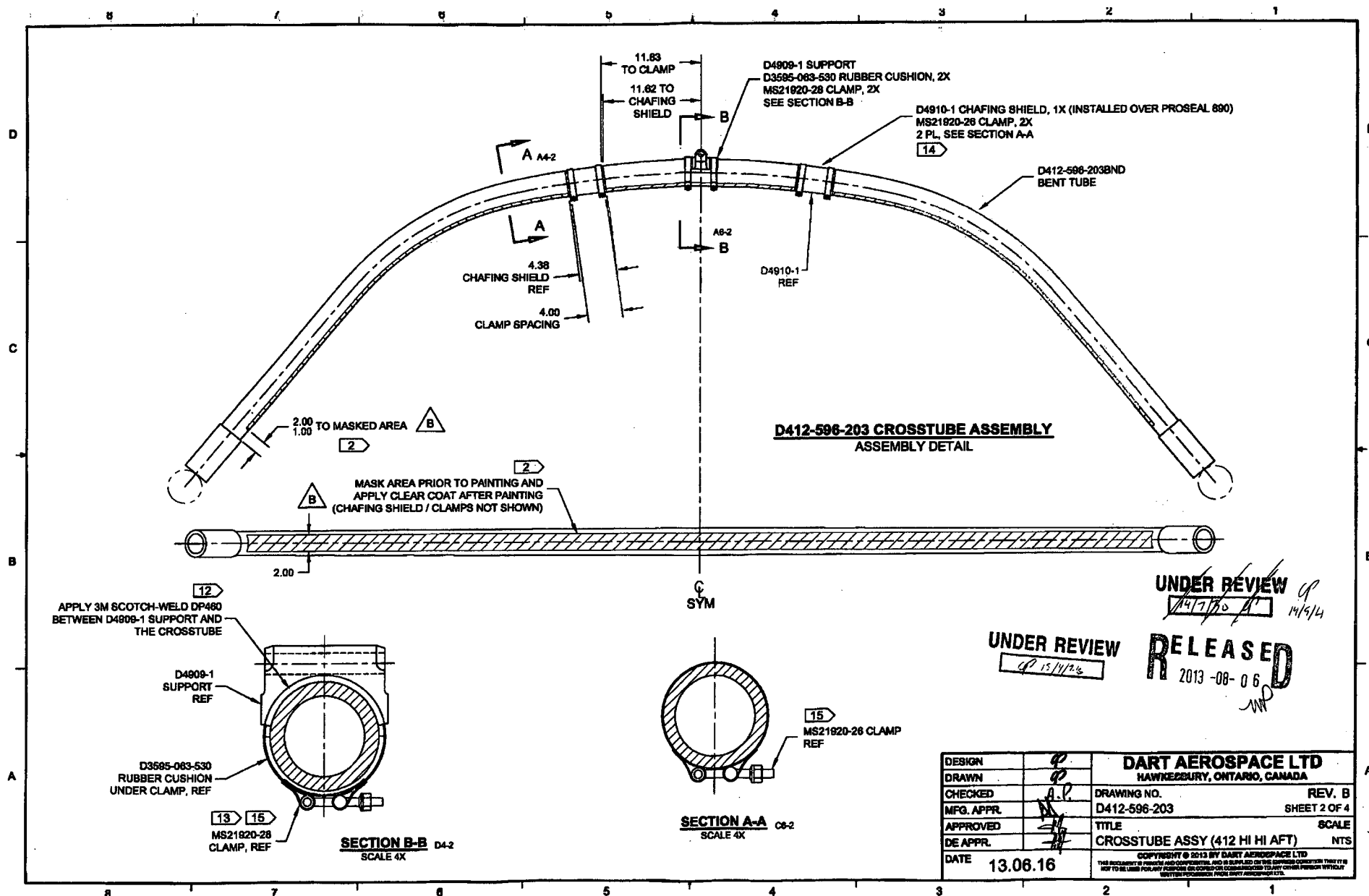
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11/15/13
URF 15-561

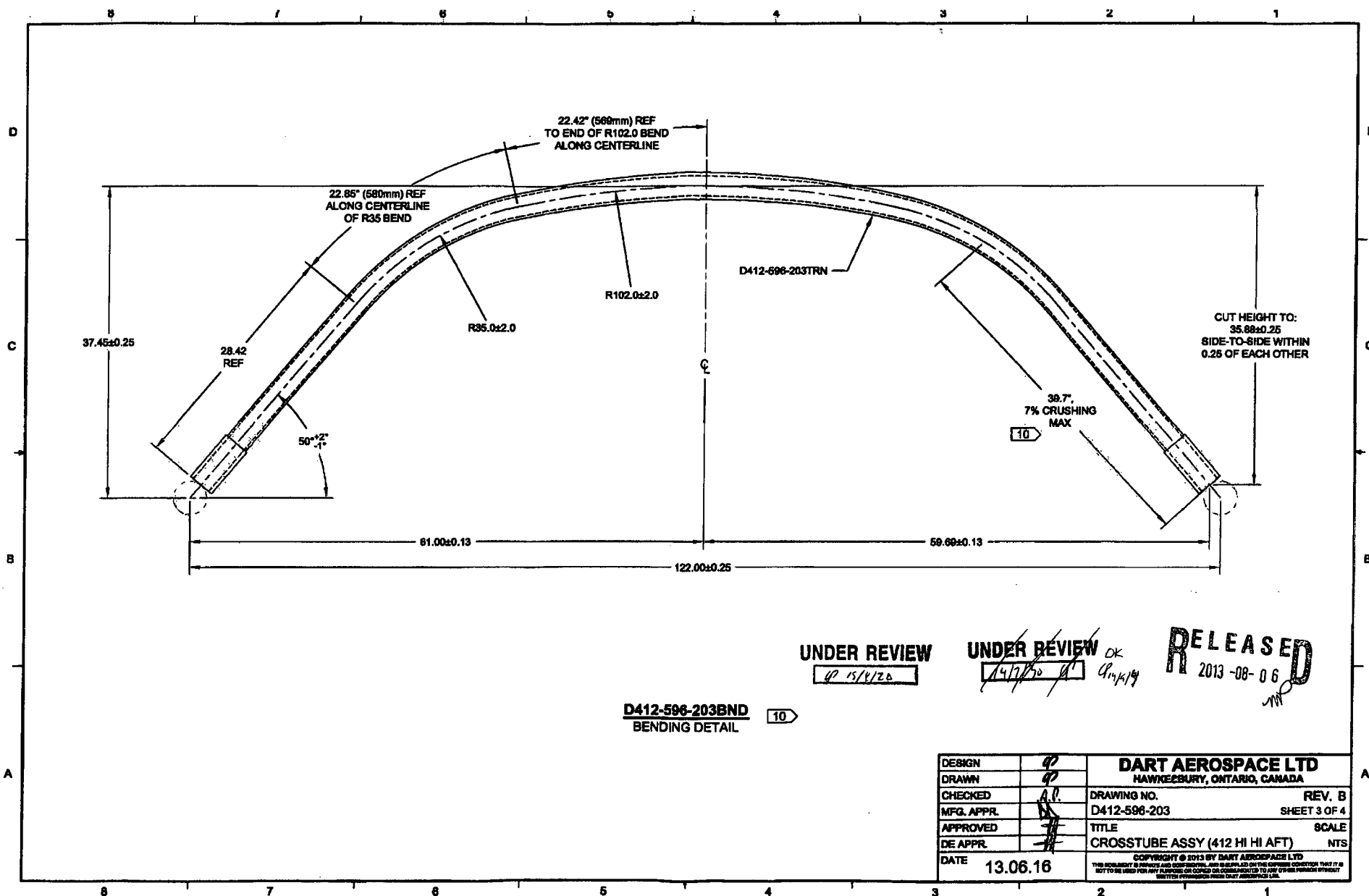
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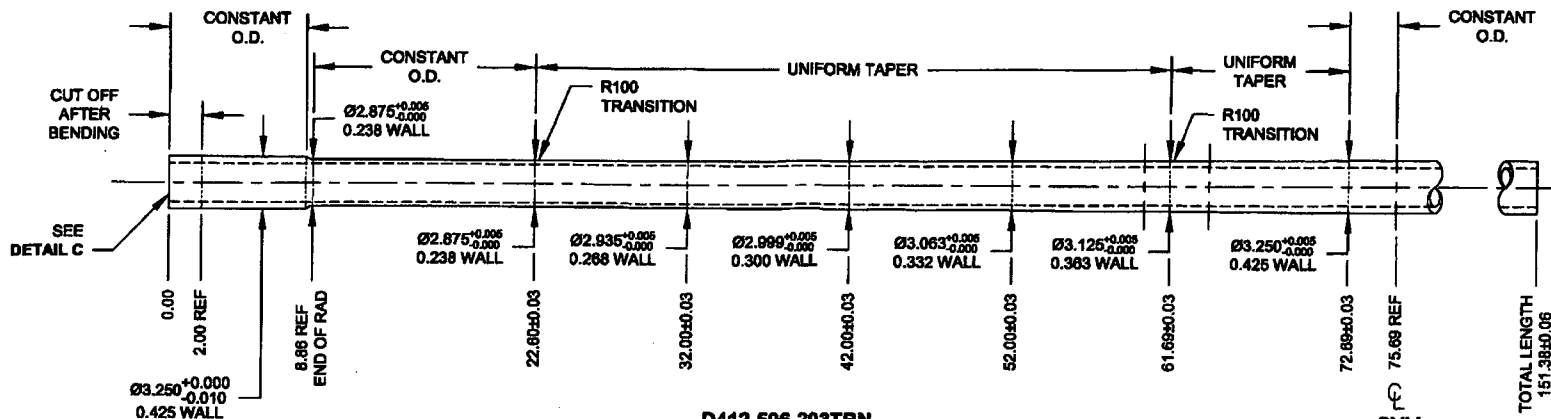
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SH 135132

B	ADD INSPECTION WINDOW (ZN C8-1, B8-2)	CP	13.06.16
A	NEW ISSUE	CP	13.03.13
REV.	DESCRIPTION	BY	DATE
DESIGN	DP		
DRAWN	DP		
CHECKED	AP		
MFG. APPR.	DP		
APPROVED	DP		
DE APPR.	DP		
DATE	13.06.16		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D412-596-203	REV. B SHEET 1 OF 4
TITLE CROSSTUBE ASSY (412 HI HI AFT)	SCALE NTS
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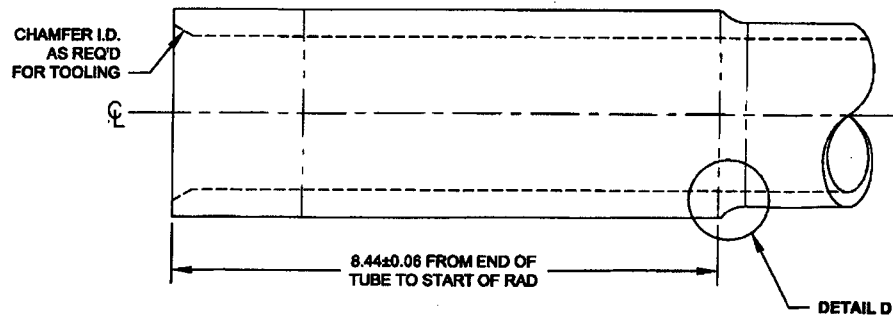




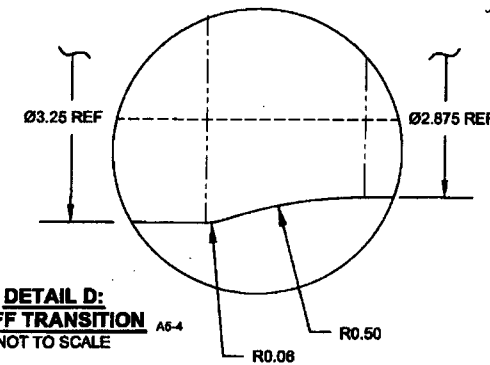


D412-596-203TRN
TURNING DETAIL

RELEASED
2013-08-06



DETAIL C:
CUFF TRANSITION
SCALE 4X



UNDER REVIEW
11/14/14

DESIGN	11/14/14	DART AEROSPACE LTD	
DRAWN	11/14/14	HAWKESBURY, ONTARIO, CANADA	
CHECKED	11/14/14	DRAWING NO.	REV. B
MFG. APPR.	11/14/14	D412-596-203	SHEET 4 OF 4
APPROVED	11/14/14	TITLE	SCALE
DE APPR.	11/14/14	CROSSTUBE ASSY (412 HI HI AFT)	NTS
DATE	13.06.16	COPYRIGHT © 2013 BY DART AEROSPACE LTD	
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